Level of Perceived Employability of Engineering Students in Kathmandu Valley

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Abstract

The discourse of employability revolves around the mitigation of mismatch between educational outcomes and the job market demand. This discourse is pertinent in engineering education as it is dedicated to producing human resources with the required employability skills. In this context, the students - to whom employability is transformed - are in the central focus. Their perceptions about their abilities in demonstrating and performing in the world of work require attention to connect education and their work. Considering this, the level of perceived employability of the engineering students studying in their final year was measured by using a self-constructed scale in a representative sample of 314 students of Kathmandu valley. The finding shows that the graduating students’ perceived employability was not consolidated and optimised to reflect on their behaviour and practices. It is at the level of ‘emergence’ and ‘presence’, which is thus not enough to see in their abilities to perform better. Therefore, the students were not able to perform as per the expectation of the market. The key implication of this study is that the gap of work-study transition stipulated to be minimised for the employability of the graduates with their exposure in the world of work.

Keywords: employability, competencies, work-study transition

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Introduction

The notion of employment is considered very important in present-day society. This is crucial in the context of developing countries like Nepal, where there is 57.9% of long-term unemployment. In the situation of unemployment, getting the first job is always challenging. In many cases, it may take a long time after graduation (National Planning Commission, 2018). The students’ transition from their study to work becomes an issue for scholars and practitioners (Law, 2018). In this context, addressing the transition is very pertinent to equip the graduates to be competent in the job markets to enter the job market soon after graduation. Importantly, with the competencies that graduates gain in their universities, they can quickly turn themselves into skilled and highly productive workforces and accelerate the country’s overall economy (Ministry of Labour, Employment and Social Security, 2015).

However, without the attributes necessary for the job market, the graduates can hardly feel comfortable entering the job market. In this context, employability - the attribute of getting employment - is considered important in the 21st century.

The concept of employability is broad, and a wide range of proficiencies are needed for its effective functioning. It is not just limited to employment. It is a set of achievements, core skills, understandings, and personal attributes that make the graduates more likely to gain employment and be successful in their chosen occupations, which benefit themselves, the workforce, the community, and the economy (Yorke, 2006). Some authors limit it to employability skills and attributes, and others argue that this is a narrow usage of employability (McQuaid & Lindsay, 2015). Therefore, constructs of employability are mostly contextual and dynamic. When it comes to the life of students, it is the perception of an individual student on her/his capacity to get employment (Hillage & Pollard, 1998); and it reflects how her/his employability has been developed with time and circumstances (Gonzalez et al., 2017).

Employability can only be determined by personal and contextual factors that surround the individual (Gonzalez et al., 2017). Hence, the perception of an individual is an important element determining employability. It is because the students with a high level of perceived employability are optimistic and confident to demonstrate their abilities in the industry (Cuyper & Witte, 2006). The research on the perceived
employability of the students also serves as a self-assessment tool to identify the weakness so that they can stress the factors that make them employable in the given circumstances (Gonzalez et al., 2017). The above explanation shows that research studies on perceived employability are pertinent as they provide an important aspect to connect to students’ future employability. There is a sense of concern and fundamental prerequisites on considering employability to be developed contextually and locally. However, there is a dearth of studies on perceived employability in the context of Nepal. This article reports a study that identified the level of perceived employability of engineering students in terms of their level of self-perceived competency.

**Engineering Education and Employability**

Engineering education in Nepal is considered a highly recognised degree. It is contemplated as skill-based education with in-depth knowledge and competent skills. A highly skilled workforce with an emphasis on the interdependence among education, industrial policies, and the broader economy are believed to support the overall economy of the country (Ministry of Labour, Employment and Social Security, 2015). Engineering education is said to be an easy gateway to enter the job market, but in reality, their competencies are often questioned (Pahari, 2011). Limited exposures, inappropriate teaching-learning methodology, and absence of job placement services are considered weak areas of engineering education in Nepal (Bhattarai, 2009). In many cases, the level of engineering education regarding skills is considered low from employers’ perspectives (Sharma, 2019).

In general, engineering education is essential to being up to date and producing lifelong learners for a creative and innovative society (Law, 2018). It contributes to the skill enhancement supporting each engineering student to be on their best forms, meaning to do the best job or create opportunities for others (Bhattarai, 2009). The industry cannot value the engineering certificates if students do not have productive engagement during education on practical aspects. Education with little practical exposure results in lower performance and thus higher unemployment (Sharma, 2015). Although unemployment has several dimensions, the mismatch between the educational preparation of graduates and the available opportunities is a major challenge of engineering education. The skillset developed by engineering students during their academic journey is not enough for the workplace (Shakya, 2011).
Industries requirements are changing, but the curriculum and engagement of the students are not updated frequently. In many cases, the discourse on employability is hardly integrated into technical education (Karki, 2013). On top of that, the notion of employability is rarely given importance.

The understanding of students’ competency contributes to preparing the strategies to meet the demand of the market. It may reduce the current work-study mismatch. While it is true that the mismatch in engineering education has not been addressed (Paudel, 2006), the major issue that has not been addressed yet is to explore the factors and levels of students’ perceived employability in the context of the mismatch between market expectation and competencies of fresh graduates. In such a scenario, there is a need to understand the level of perceived employability of engineering students to articulate, analyse and address the future demand of promoting employability for engineering education in Nepal.

**Social Cognitive Career Theory and Perceived Employability**

The context of the fresh graduates can be best described with social cognitive career theory (SCCT). Albert Bandura’s (1986) general social cognitive theory, an influential theory of cognitive and motivational processes, has been extended to the study of many areas of psychosocial functioning, such as academic performance, health behaviour, and organisational development. Thus, SCCT is an extended theory of social cognitive theory. It is more concerned with the specific cognitive mediators through which learning experiences guide career behaviour, with the manner in which variables such as interests, abilities, and values interrelate, and with the specific theoretical paths by which person and contextual factors influence career (Lent et al., 2002). For this study, the interests and contextual factors of the students matter to the perceived employability. SCCT also highlights how individuals for their career development. As career development is directly linked with their personal and career path, the theory provides the lens to explore the factors of perceived employability.

SCCT accommodates not only the personal context but also the environment and social contexts. It implies that environmental factors can have a major influence on career courses. It affects the learning process through which self-efficacy, outcome expectations, and skills are formed. It also impacts the choice options that are made available and encouraged (or discouraged) and the career advancement opportunities
that are manifested (Lent et al., 2002). In this connection, learning process, outcome
expectation, formed skills and choices, and opportunities are embedded in the
graduates’ perceived employability that helps construct useful conceptual connections.
Further, it helps to identify major factors that may comprise a comprehensive
explanatory system and sketch central processes, linking these factors together and
categorising the most important factors as the major priority.

Roadmap of the Study

The study featured quantitative methods by adopting the post-positivist approach.
As a research approach, it calls for explaining the variables within employability
(Crotty, 1998). For the researcher, epistemology in this study helped to uncover
knowledge in the social context (Kivunja & Kuyini, 2017). Therefore, the
epistemological assumption of this study was that the levels of perceived
employability could be obtained by employing a proper method. Such measurement
was based on the empirical knowledge generated through individual understanding
and self-assessment using objective methods.

The tool of the study was constructed by using Delphi Method with the
consultation of experts of engineering education (Crawford & Wrights, 2016). In the
process, initial items were identified, and their dynamics were examined (Linstone &
Turoff, 2002). Then, the tool was implemented to the constituent engineering colleges
of Tribhuvan University located in Kathmandu (Pulchowk Engineering College and
Thapathali Engineering College) and Kathmandu University (School of Engineering).

The rationale for selecting a constitutional college was that they were under the
direct management of the universities. The final year students were selected as they
were at the stage of finalising the academic degree and getting prepared to enter the
labour market.

In order to draw the sample for this study, the list of students was collected from
the selected colleges. This provided the total number of final year engineering students
that was 1450. A total of 314 sample size was determined by using the sampling
formula of Yamane (1967), and the sample was randomly selected. To select the
participants, proportionate random sampling was used considering the ratio of the
students of all constituent colleges (Gravetter & Forzano, 2006) to ensure fair
representation of the sample from each of the colleges (Thompson, 2012). Then, the
lottery method was used to select the required number of samples from each selected college. From 528 students of Pulchowk Engineering campus, 114 were selected; from 432 of Thapathali Engineering Campus, 94 students were selected; and from 490 of the School of Engineering, 106 were selected.

The data were collected visiting each campus. The collected data were entered into SPSS 25, and, with the factor analysis, thirty-nine items were loaded into five dimensions. The loaded factors were named with the support of experts in the area of engineering education and from literature. Among them, the items that were related to the personal qualities of engineering students which would help them to be employable was named as personal attributes. The skills that were considered fundamental skills of an engineer are considered core items. The collective meaning of all core items of loaded items was closer to the core features of engineers, and it was named core attribute. The items essential to managing self and self-control were named self-management. Likewise, the attributes that signified the involvement of the person in direct work and could be achievable with regular efforts over time gradually were named as process attributes. The items that guided the students to be employable were named career guidance. Then the mean of each factor was obtained, and the mean interval of it was calculated by dividing it by 3 (Polit et al., 1997) to understand the perceived level of employability.

In analysing the level of perceived employability, a standard competency scale was also used (Langlois & Lapointe, 2010). The scale consisted of the typologies in which the score from 1.0 to 3.5 indicated the “traces”, the score from 3.6 to 4.4 is indicated as “emergence”, 4.5 to 4.8 as “presence”, 4.9 to 5.5 as “consolidation” and 5.6 to 6.0 as “optimisation level. The mean value of each attribute was taken as the score for the scale. The typologies helped well to examine the level of perceived employability among graduating students.

For the reliability of the scale, the split-half technique was used. Further, the internal consistency Cronbach alpha test was employed. An acceptable reliability coefficient of 0.70 was considered the base for further amendments. Cronbach’s alpha value below 0.7 was not accepted (Cohen et al., 2018). For validity, three major forms of validity were considered in this study: content validity, construct validity, and criterion-related validity (Cohen et al., 2018). Content validity in this research was
ensured by the questionnaire covering the factors predicting perceived employability among the students based on the periphery of engineering education. Related literature and the experts’ knowledge and experiences were reviewed. The construct validity was assured with the study variables that were determined based on adopted theories. For this study, the construct validity was based on the framework of perceived employability provided by Yorke (2006). The Yorke framework was revised slightly based on the outcome of the Delphi process. The personal qualities, core and key skills and transferable skills from his framework are elaborated on the basis of Delphi process outcomes. The criterion-related validity (Kerlinger, 2008) was ensured with the comparison of the study to other similar studies conducted around the world.

The study maintained the ethics by ensuring the dignity of the individual, the accuracy and honesty in the data and information (Gravetter & Forzano, 2006). Consent was taken from the respondents, and they were provided information on the research and its consequences. The respondents’ names and addresses were not disclosed, and the data provided by the respondents were assured not to be reported individually or personally.

The Respondents

Table 1 presents the demography of the final year engineering students and their geographical and educational background.

Table 1

<table>
<thead>
<tr>
<th>Demographic Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>242</td>
<td>77.1</td>
</tr>
<tr>
<td>Female</td>
<td>71</td>
<td>22.6</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brahmin</td>
<td>169</td>
<td>53.8</td>
</tr>
<tr>
<td>Chettri</td>
<td>69</td>
<td>22.0</td>
</tr>
<tr>
<td>Janajati</td>
<td>62</td>
<td>19.7</td>
</tr>
<tr>
<td>Dalit</td>
<td>9</td>
<td>2.9</td>
</tr>
<tr>
<td>Others</td>
<td>5</td>
<td>1.6</td>
</tr>
</tbody>
</table>

*Respondent’s permanent residence
The results showed that female participation in the engineering course was still lower than those of males. This data also mirrored the national enrolment of female students in technical higher education, which is 14.07% (Ministry of Education, Science and Technology, 2017).

Regarding ethnicity, the majority of the respondents were Brahmins (53.8%) which was more than 50% of the total respondents, followed by Chettri (22.0 %), Janajati (19.7 %) and Dalit (2.9%). Therefore, the percentage of enrolment of the Dalits (2.9%) in engineering education was very low in comparison with the other groups.

Among samples, a majority (46.2 %) of the students were from Bagmati Province. No students were selected from Karnali Province, and there were only 5.4% from Sudurpaschim Province. Thus, the heavy concentration of sampled students was from Bagmati Province (46.2 %). Data were also collected on the types of schools of the selected students before joining their engineering degrees. The types of schools had been categorised into the community (government-funded) and institutional (private funded). The majority of the respondents had a background in institutional schools (76.8 %). This is an indication of the fact that the majority of sampled students are from schools located in urban areas, which are generally supposed to be catering for those from middle and high-class families. This is, however, not necessarily true in all cases.
The level of perceived employability is presented in Table 2. The basis of the analysis was mean and standard deviation. After presenting the category, level of the perceived employability of engineering students was discussed with the typology of Langlois and Lapointe (2010).

**Table 2**  
*The level of Perceived Employability of Engineering Students by Their Attributes*

<table>
<thead>
<tr>
<th>Level of Perceived Employability of Engineering students</th>
<th>High N (%)</th>
<th>Medium N (%)</th>
<th>Low N (%)</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal Attributes</td>
<td>223 (71.0)</td>
<td>78 (24.8)</td>
<td>13 (4.1)</td>
<td>4.67</td>
<td>0.95</td>
</tr>
<tr>
<td>Core Attributes</td>
<td>197 (62.7)</td>
<td>100 (31.8)</td>
<td>17 (5.4)</td>
<td>4.52</td>
<td>0.96</td>
</tr>
<tr>
<td>Self –Management</td>
<td>192 (61.1)</td>
<td>102 (32.5)</td>
<td>20 (6.4)</td>
<td>4.57</td>
<td>1.11</td>
</tr>
<tr>
<td>Process Attributes</td>
<td>167 (53.2)</td>
<td>117 (37.3)</td>
<td>30 (9.6)</td>
<td>4.31</td>
<td>1.13</td>
</tr>
<tr>
<td>Career Guidance</td>
<td>156 (49.7)</td>
<td>121 (38.5)</td>
<td>37 (11.8)</td>
<td>4.16</td>
<td>1.13</td>
</tr>
</tbody>
</table>

Table 2 shows that majority of the students were under the category of ‘high’ in all dimensions of perceived employability. There were remarkable scores of the students under the medium and low category regarding career guidance. This shows that career guidance had not been emphasised much as compared to the other dimensions. The results are also examined as the dimensions of the typologies of competencies. The output is that the dimensions such as process attributes (4.31) and career guidance (4.16) were at the emergence level, whereas personal attributes (4.67), core attributes (4.52) and self-management (4.57) were in the presence level. This shows that the dimensions of process attributes and career guidance were just visible among the students and thus were not developed well to reflect in the workplace. Similarly, the dimensions of personal attributes, core attributes, and self-management were in the stage of presence level, and they were not actualised and reflected on behaviour and practices for employability. To make it clearer, students are not yet capable of reflecting these attributes in their behaviour and practices for employability. Therefore, the engineering graduates are not well prepared for the need of the labour industry while they finalise their studies.
Discussion: Market Expectation vs. Level of Perceived Employability of the Students

The industry sector and employers expect that fresh engineers are well equipped with the knowledge and skills required to perform the job (Pinto & Ramalheira, 2017). However, the study reveals that whatever knowledge students do have, is not at the level that could be reflected in their work practices. The reflection of knowledge into practice is possible only when the graduating students’ knowledge, skills, and competencies are at the higher levels, that is, at the levels of consolidation or optimisation.

Practical skills are keys to entering the engineering industry, but the current level of education is not sufficient for the engineering graduates to be prepared for the market (Pahari, 2011). The engineering sector demands hands-on experience and practical skills in the related field as one of the basic requirements of any engineering stream (Creasey, 2013). The prevailing culture of learning in the context of Nepal means reading books only. It does not signify having practical work or gaining exposure to relevant work (Regmi, 2017) that can be rectified to meet the expectation of the market. Expected optimisation levels can be obtained through the proper practical exposures, effective internship or work-based learning opportunities, and apprenticeship opportunities (Blom & Saeki, 2011). Enough practical exposures are considered to support engineering education. There are different strategies adopted for effective and successful outcomes of engineering education. For example, Singapore focuses on school-based vocational and technical education, whereas Germany and Switzerland stress dual vocational and technical education (Rageth & Renold, 2017). However, engineering education in Nepal is still theoretically based and has inadequate opportunities in terms of practical exposure (Bhattarai, 2009).

Another important aspect of practical education is the linkage between education and employment. In our current system, such linkages are not seen. Lack of linkages between the employers and the academic institutions do not seem to build a proper ecosystem for the engineering graduates. Such linkages can be maintained if the employers and academic institutions are linked in terms of design, pedagogy, and exposure to fulfil the demands of the industry. Similarly, the involvement of the private sector in the academic institutions also deepens the understanding of the
academic institutions in skills in demand and responds well to the particular requirements (Rahmat et al., 2012). There is also an equal role of the private sector to address the skill gaps and enhance the level of the engineering students (Berntson et al., 2006) from the existing to the required level.

In this context, the linkage between the industry and engineering education is explained in the model presented in Figure 1. This model unveils the existing situation of engineering education in Nepal and its relation with industry. It also shows the need for enhancing the required attributes of the engineering students. Furthermore, this model presents the present level of the perceived employability of engineering students. It also brings a notice that the personal attributes, core attributes, and self-management are the qualities that are at the presence level and that the process attributes and career guidance are at the emergence level. Additionally, this model also flaunted the possibility to recuperate the high-level skills requirement of the industry. It puts forward the importance of self-efficacy of the engineering students to enhance the level of competencies by building their confidence and providing the required environment (learning process, outcome expectation, formed skills and choices, and opportunities) by the engineering education and industry.

Figure 1

*Model of Linkage between Engineering Education and Industry*
As academic institutions are part of the broader societal context to build a support system, academic institutions can help engineering graduates cope with perceived employability barriers. When academic institutions collaborate and coordinate with the broader context of industry, they can create a supportive environment for engineering students to be successful in their career path by mitigating the existing gaps in engineering education. SCCT is useful to explain such environment as the background, and the immediate context of the students is supportive for their future career. The career development of the engineering students is determined by their self-efficacy, immediate proximal context, and larger societal context (Lent et al., 2002). As this study is focused on perceptions of students’ performances, the performance model of SCCT is linked to the level of performance of the engineering students. The performance model predicts the performance as well as provides linkages with persistent efforts that an individual put into the goals and performance level (Lent et al., 2002) they attain in their career. In this study, the perceived employability of the engineering students, as suggested by SCCT is highly influenced by their personal, societal context and the environment they are in.

The other important aspect of a career is the level of performance which depends on what an individual knows and how they act. The act is developed from the beliefs of the ability to accomplish (Bandura, 1986). Such components affect the students’ goals and directly impact the performance they attain (Jackson, 2016). Mitigating barriers at the personal level, proximal, and broader context aspire to excel in an individual field of interest in this context. An individual’s effort in mastering skills plays a vital role in employability.

**Conclusion**

Among the factors of perceived employability of the engineering students, the process attributes and career guidance have just emerged. The personal, core and self-management skills are just present. Therefore, all these attributes are not reflected in the practice of the engineering students at the optimum level as required by the industry. To outperform this level, there is a need for a strong collaboration between the industry and the academic institution. However, the collaboration of the academic institutions and the industries are not at the level of expectations as there are inadequate collaborations and coordination. In this techno-driven era, this has become
crucial that the academic institutions and industries collaborate well to reform engineering education. It is crucial that the initiation from the enterprises and academic institutions is necessary to carry out research and collaboration for enhancing engineering education. The initiation would enhance the current level of employability as well.

References


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